REMARKS

In the Office Action mailed on December 22, 2003, the Examiner first objected to claims 1 and 15 due to the noted informality, which is addressed in the foregoing amendment. The Examiner rejected claims 1, 4, 6-12, 15, 18, 20, 21, 26, and 27 under 35 U.S.C. §103(a) as obvious over Lustig et al. in view of Canaperi et al.; claims 5 and 19 under §103(a) over Lustig et al. in view of Canaperi et al. and further in view of Chu et al.; and claims 22-25 under §103(a) over Lustig et al. in view of Canaperi et al. and further in view of Kant.

In making his rejections over Lustig et al., the Examiner recognizes that the reference "fails to show the surface and the strained layer having an average roughness less than 1 nm." For this feature he cites Canaperi et al., col. 5, lines 35-58. It is true that Canaperi et al. describe smoothing a SiGe layer followed by deposition of, e.g., Si thereover. But Canaperi et al. did not face the problem solved by the present inventors, and therefore their disclosure cannot fairly suggest the present claims as amended.

As explained in the present application at page 9, lines 4-6, "for any relaxed SiGe layer that is relaxed through dislocation introduction during growth, the surface roughness is unacceptable for state-of-the-art fabrication facilities." In other words, it is the presence of the graded SiGe layer that causes the persistent emergence of surface roughness in overlying layers, and in particular in the strained channel layer.

Canaperi et al. do not utilize a structure in which a graded SiGe layer underlies the channel layer. As illustrated in Figs. 1-7 of the Canaperi et al. patent, a relaxed SiGe layer 30 underlies an "encapsulation" layer 40, which need not even be crystalline (see col. 3, lines 61-66). Layer 40 is bound to a substrate 80 (Fig. 3), and layer 30 is then split. It is upon the newly exposed surface of SiGe layer 30 that a Si layer may be deposited so as to experience strain. But Canaperi's graded SiGe layer is not part of the structure upon which the strained channel layer is formed.

As a result, the cause of roughness persisting into the channel layer does not exist, in contrast to the structure recited in the present claims. The problem addressed by the present invention, therefore, is simply not suggested by Canaperi et al. For this reason we respectfully traverse the combination of references advanced by the Examiner.

In particular, the Canaperi et al. patent would not motivate one of skill in the art to smooth the layers of Lustig et al. As the Examiner recognizes, neither reference involves a graded SiGe layer beneath a strained channel layer, and both references are therefore irrelevant to the claims as amended.

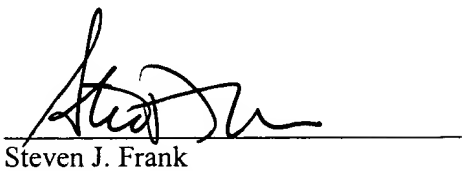
The Examiner cites Chu et al. for this feature. But Chu et al., like Lustig et al., does not suggest smoothing. At the time the invention was made, practitioners would have had no motivation to smooth a subchannel layer of the Chu et al. structure, because they would have expected the

benefits of smoothness to be lost in the overlying lattice-mismatched layer (with the emergence of the characteristic, dislocation-induced roughness) due to the presence of the underlying graded SiGe layer. That expectation would not have been challenged by Canaperi et al., since Canaperi et al. avoid relaxation mechanisms through their bonding process and the absence of a subchannel graded SiGe layer.

Again, Canaperi et al. utilize a bonding approach that expressly avoids relaxation and, therefore, the relaxation-induced problems that the present invention solves. The Canaperi et al. patent, therefore, is simply irrelevant to these problems, and to references like Chu et al. that involve them.

In light of the foregoing, we submit that all claims are now in condition for allowance. Please charge any fee occasioned by this paper to our Deposit Account No. 20-0531.

Respectfully submitted,



Date: April 7, 2004
Reg. No. 33,497

Steven J. Frank
Attorney for Applicant(s)
Testa, Hurwitz, & Thibeault, LLP
High Street Tower
125 High Street
Boston, Massachusetts 02110

Tel. No.: (617) 310-8108
Fax No.: (617) 248-7100